

## 2021 PENNSYLVANIA CLIMATE ACTION PLAN GHG REDUCTION STRATEGIES WORKING LIST

Information in this document is a work in progress. The intent of this document is to provide additional information to the Pennsylvania Climate Change Advisory Committee around greenhouse gas reduction strategies for the 2021 Pennsylvania Climate Action Plan for feedback. This feedback will be considered by the Pennsylvania Department of Environmental Protection as the process moves in to report drafting and supporting modeling efforts.

Sector	GHG Reduction Strategy	Additional Details	Expected Implementation Timeframe	Primary Actor	Air Quality/Public Health Benefits or Costs	Resilience Benefits or Costs	Environmental Justice and Equitable Implementation Benefits or Costs	Model
Buildings	Expand Act 129 (e.g., increase savings targets and remove spending caps, cover gas as well as electricity), and provide other incentives and education by leveraging programs like LIHEAP and WAP.	This would be an expansion of the existing Act 129 program to increase success and extend timeframe. <ul style="list-style-type: none"> <li>Increase LMI share of spending</li> <li>Reform cost-effectiveness tests to support more LMI focus, and add climate mitigation and resilience benefits to cost effectiveness tests</li> </ul>	Near-term	State Government	Reduced energy use = improved air quality and public health benefits through reduced point source emissions (e.g., from EGUs) and improved local air quality from reduced use of on-site fuels.	Resource efficiency benefits energy supply resilience.	This program has had mixed benefits and costs. Reduction in air pollution as a result of lower energy use is a benefit, but many EJ or lower income communities are not benefiting financially from the program.	Yes
Buildings	Incentivize building electrification (e.g., heating and hot water)	As part of this strategy specific attention would be focused on where and how this can be applied in Pennsylvania, particularly for the residential and commercial sectors.	Long-term	State Government	While electricity use increases, paired with an expanded AEPS increased air pollution may not be of concern. Additionally, localized air quality at end use will be improved due to reduce on-site combustion at homes and businesses.	Can create risks if not coupled with enhanced electricity supply (storage, on-site generation, expanded generation capacity), as natural gas is typically more resilient in supply than electricity.	The costs are a barrier right now for equitable implementation, but localized AQ and health benefits, if programs are designed to access these communities, could be gained.	Yes
Buildings	Support EE through building codes: adopt most current building codes, enforce existing codes, encourage local adoption of stretch codes, educate code officials on code enforcement.	Create legal ability for local governments to adopt stretch codes  For net zero energy codes, create implementation framework for verifying offsite RE purchases  Create provisions for voluntary programs that exceed codes as "deemed to comply"	Near-term	State Government	Reduced energy use = improved air quality and public health benefits through reduced point source emissions (e.g., from EGUs) and improved local air quality from reduced use of on-site fuels.	Resource efficiency benefits energy supply resilience	Potential improved energy efficiency, indoor air quality, and other benefits for low income housing developments if the program is designed with an angle towards these target areas and populations.	Yes

<b>Buildings</b>	Introduce state appliance efficiency standards	A state-level appliances standard regulatory system would be created that covers specific appliance and equipment that are not covered by current federal NAECA regulations.	Near-term	State Government	Reduced energy use = improved air quality and public health benefits through reduced point source emissions (e.g., from EGUs) and improved local air quality from reduced use of on-site fuels.	Resource efficiency benefits energy supply resilience.	Cost savings for consumers over lifetimes of products. It may take time to cycle new appliances in for rental or lower income communities though.	No
<b>Buildings</b>	Take actions to promote and advance C-PACE financing and other tools to encourage and promote the implementation of healthy high-performance and net-zero buildings.	This includes actions such as education, working with local governments and businesses, etc. Net Zero buildings could be focused, for example on new construction only. Other examples may include programs like Keystone HELP, property tax abatement strategies, and Green Banks.	Mid-term	State Government	Reduced energy use = improved air quality and public health benefits through reduced point source emissions (e.g., from EGUs) and improved local air quality from reduced use of on-site fuels.	Resource efficiency benefits energy supply resilience. However, building electrification can create risks if not coupled with enhanced electricity supply (storage, on-site generation, expanded generation capacity), as natural gas is typically more resilient in supply than electricity.	Potential improved energy efficiency, indoor air quality, however we know from recent experience in PA there are a number of barriers for implementing this equitably.	No
<b>Transportation</b>	Implement the MHDV MOU (net zero emissions from MHDVs by 2050).	This would be achieved through a mix of fuel switching, including electric and other alternative fuel vehicles. Pennsylvania has already signed on to the MOU.	Mid-term	State Government	Reduced local air pollution from on-road transportation. Could lead to improved public health and benefits (e.g., reduced deaths, asthma cases)	Potentially diversifies energy sources	Potential benefits in air quality for communities near major roadways	Yes

<b>Transportation</b>	Increase adoption of Alternative fuel vehicles, by following the EV Roadmap, using a ZEV mandate, providing education and outreach, additional or modified incentives through AFIG and AFV, and approaches to reaching low-income communities.	Leverage actions outlined in the EV roadmap and consider specific targets for new sales or vehicles registration for EV and other alt fuel vehicles.	Mid-term	State Government	Reduced local air pollution from on-road transportation. Could lead to improved public health and benefits (e.g., reduced deaths, asthma cases)	Can create risks if not coupled with enhanced electricity supply (storage, on-site generation, expanded generation capacity)	Potential benefits in air quality for communities near major roadways. However, the benefits of this program as designed cannot reach lower-income communities.	Yes
<b>Transportation</b>	Reduce vehicle miles traveled for single-occupancy vehicles by implementing travel demand strategies such as shifting travel time, mode choice, and route, and increasing frequency of telecommuting. Pair these efforts with land-use and development policies that promote sustainable transportation modes (walking, biking, transit, carpool).	This would take significant coordination with local and state agencies as well a business to reduction travel in SOVs. This strategy would focus mainly on personal vehicles. It would take a potentially more conservative approach than in the 2018 CAP.	Long-term	Local Government	Reduction in VMT provides localized air quality improvement, as has been proven during COVID-19.	Potential expansion of public infrastructure, which would support emergency services	Potential benefits in air quality for communities near major roadways. Careful implementation is needed to ensure measures are inclusive.	Yes
<b>Transportation</b>	Implement a Low Carbon Fuel Standard	This program would focus on decreasing the carbon intensity of transportation fuels and provide more supply and range of alternative fuels. This would expand on the ethanol and biodiesel requirements already in place in PA.	Mid-term	State Government	Reduced local air pollution from on-road transportation. Could lead to improved public health and benefits (e.g., reduced deaths, asthma cases).	Diversifies energy sources.	Potential for improved air quality near major roadways, however also potential for increased fuel prices .	Yes
<b>Industrial</b>	Increase industrial energy efficiency through actions such as providing more trainings on energy efficiency for industry (e.g., through E4) and expanding energy assessments.	Leverage existing programs from DEP and the types of actions outlined in the new PA CEPP. This will include a focus on specific industries, or sizes of industries, but also leverage broader tools such as virtual trainings and expanded partnerships to reach smaller and harder to access industries.	Near-term	State Government	Reduced energy use = improved air quality and public health benefits through reduced point source emissions (e.g., from EGUs) and improved local air quality from reduced use of on-site fuels.	Resource efficiency benefits and energy supply resilience.	Potential air quality improvements in communities near emitters; this could be leverage for workforce training with DCED or others to target workers needing jobs, particularly with the COVID-19 recovery.	Yes

<b>Agriculture</b>	Offer programs, tools, and incentives to increase energy efficiency for agricultural end uses such as refrigeration, ventilation and lighting	Build off recent EnSave report and strategies.	Near-term	State Government	Reduced energy use = improved air quality and public health benefits through reduced point source emissions (e.g., from EGUs) and improved local air quality from reduced use of on-site fuels.	Resource efficiency benefits energy supply resilience	Consider if there are communities with large agriculture resource that will benefit from these programs and how that will increase equity across the state.	Yes
<b>Agriculture</b>	Provide trainings and tools to implement agricultural best practices, such as those focused on no-till farming practices and integrated farm management and conservation planning, soil mgmt. practices could include rotational grazing, silvopasture, organic and regenerative agriculture		Mid-term	State Government		Improving resource efficiency for soils and farming, prevents on-site erosion	Improved food quality for consumers, but potential for increased costs in food prices	Yes
<b>LULUCF</b>	Expanding Forest and crop lands (soil) and managing to sequester carbon naturally, and increasing urban green space.	Consider concepts such as property tax abatement for ag and other conservation reserve type categorization. Also transferable development rights, development rights can be sold to landowners in urbanized areas. Also consider approach of planning authorities issuing development guidelines that support these strategies.	Mid-term	State Government	More trees = cleaner air.	Preserves/expands natural ecosystems that can act as natural buffers for extreme events related to climate change. Can be coupled with adaptation planning for flood control, coastal hazards and other climate vulnerabilities. Expanding natural coastal buffers (e.g., wetlands) in particular can support coastal flooding resilience	Potentially could address inequalities with regard to heat islands and access to green space	Yes

<b>Fuel Supply</b>	Increase the production and use of bio/renewable gas (e.g., as from coal mines, agriculture, wastewater, and landfills)	This strategy would consider the potential for renewable gas and specific applications within Pennsylvania across a number of feedstocks (as identified in the 2019 AGF RNG report). RNG use would be dedicated to applications with high value, such as industry and CHP.	Mid-term	Businesses/Industry	There are still some air pollutants associated with RNG.	Diversifies energy sources	Potential air quality improvements in communities near emitters.	Yes
<b>Fuel Supply</b>	Incentivize and increase use of distributed combined heat and power (CHP) and consider with combined use of microgrids.	Consider these in specific high value situations, like industrial applications or used in public or private building campus-style settings (public or institutional). Also consider pairing this with renewable power and renewable gas in addition to natural gas.	Near-term	State Government	While energy would be used more efficiently, air pollution would still be an issue. However, CHP could replace some heavier polluting technologies.	Diversifies energy sources, creates on-site energy source.	Consider the implementation of this strategy to benefits varied types of communities.	Yes
<b>Fuel Supply</b>	Implement policies and practices to reduce methane emissions across oil and natural gas systems	This would reflect and go beyond what is in the current ongoing rulemaking for reducing methane from oil and gas operations. This could also consider similar regulations or strategies as they may interact with increased renewable gas supply.	Mid-term	State Government	Reduced methane emissions are often paired with reductions in VOCs and other pollutants.	Resource efficiency benefits and energy supply resilience		Yes
<b>Electricity Generation</b>	Increase Alternative Energy Portfolio Standard (AEPS) Tier 1 targets and the solar share (e.g., to a carbon free grid). As part of implementing this, consider strategies to expand the development of solar and wind projects across the Commonwealth such as legislation to help develop a robust solar industry both at the distributive and grid level (PA Solar Future), and development of strategies that increase the value of solar renewable energy credits (SRECs).	This would be considered out through 2050, and likely as a carbon free grid requirement by 2050 or prior.  Review AEPS Tier 2 and other provisions to clarify what qualifies as eligible resource types.	Near-term	State Government	Reduced local air pollution from on-road transportation. Could lead to improved public health and benefits (e.g., reduced deaths, asthma cases)	Diversifies energy sources.	Potential for increased utility bills for consumers, but potential significant improvements in AQ in frontline communities near larger generators.	Yes
<b>Electricity Generation</b>	Implement policy to maintain nuclear generation at current levels.	This would assume at least 80 year lifetime extensions for plants currently in operation.	Near-term	State Government	Compared to existing baseload fossil generation, nuclear offers air quality benefits.	Diversifies energy sources	Cost of electricity will need to be considered.	Yes

<b>Waste</b>	Reduce food waste	This would consider ongoing efforts from DEP and others in this space now for the Commonwealth	Mid-term	Local Government		Improves resource efficiency	Potential for improved food access/distribution.	No
<b>Waste</b>	Reduce waste generated by citizens and business thereby reducing waste sent to landfills, and WTE facilities, and expand the beneficial use of waste.		Mid-term	Local Government	For example, this can focus on mercury emissions.	Improves resource efficiency.	Potential for improved air quality for communities near landfills.	No